

REMARKS/ARGUMENTS

Claims 1-16 are currently pending. Applicants have amended claims 1, 4 and 13 and have canceled claims 3 and 14. Applicants submit that no new matter has been inserted into the application as a result of these amendments.

Claims 1 and 2 stand rejected under 35 U.S.C. 102(a) as being anticipated by "Virtual Routing for Provider Edge Applications", a white paper by IP Infusion, Inc., 2002 (Part No. 01920001) (hereinafter "IP Infusion").

Claims 3-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over IP Infusion, in view of "The ENTRAPID Protocol Development Environment," by Huang et al., Cornell Network Research Group, Department of Computer Science, Cornell University (also appearing in Proceedings of the IEEE INFOCOM '99, March 1999)(hereinafter "Huang").

Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

Rejections under 35 U.S.C. 102

Claims 1 and 2 stand rejected under 35 U.S.C. 102(a) as being anticipated by IP Infusion.

Applicants have amended claim 1 to include features formerly recited in claim 3. Without conceding the merits of the rejection as applied to the previously presented claims, Applicants respectfully submit that the amended claims overcome this rejection.

The Office Action admits that IP Infusion fails to teach all of the features recited in claim 3 and instead relies upon Huang to teach the remaining features of claim 3. Office Action at page 6, ¶ 1. Therefore, claim 1 is not anticipated by IP Infusion for at least the reasons provided. Furthermore, claim 2 should also be in condition for allowance at least due to its dependence from claim 1.

Accordingly, Applicants respectfully request that the rejection of claims 1 and 2 be withdrawn.

Rejections under 35 U.S.C. 103

Claims 3-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over IP Infusion in view of Huang.

Applicants have amended claim 1 to include the features formerly recited in claim 3. Applicants submit that IP Infusion and Huang fail to disclose or suggest all of the features recited in independent claims 1, 7 and 13. For example, claim 7 recites, in part a routing device comprising:

an operating system kernel;
a virtual router, wherein the virtual router resides external to the operating system kernel;
a router manager configured to manage the virtual router;
an application residing external to the virtual router; and
a plurality of physical interfaces;
wherein the application is able to selectively interact with the virtual router and the operating system kernel on a dynamic basis in order to have the virtual router and the operating system kernel perform a plurality of tasks for the application

Applicants submit that IP Infusion and Huang fail to disclose or suggest at least the application is able to selectively interact with the virtual router and the operating system kernel on a dynamic basis in order to have the virtual router and the operating system kernel perform a plurality of tasks for the application as recited in claim 7.

The Office Action relies upon the general management authority (GMA) and page 3, column 1 of IP Infusion to teach this feature of claim 7. However, the GMA of IP Infusion merely provides an interface to enable system administrators to create and manipulate new virtual routers including configuring system-wide information and configuring individual virtual routers. See IP Infusion, page 5, col. 1, ¶ 5, page 6, col. 1, ¶ 4. IP Fusion is silent as to the GMA interfacing with the operating system kernel to perform a plurality of tasks for the application.

Furthermore, with respect to claim 14, which formerly recited a similar feature as that of claim 7 described above, the Office Action admits that IP Infusion fails to teach that the application is able to interact with the operating system kernel to have the operating system kernel perform a plurality of tasks for the application and instead relies upon page 5, col. 2, last paragraph of Huang to teach this feature of claim 14. Office Action, page 15, ¶ 4. The Office

Action asserts that "ENTRAPID employs proxy virtualized processes to facilitate communication between processes external to ENTRAPID and the operating system kernel" and that the processes external to ENTRAPID are equivalent to the application recited in the claims. However, the external processes described in Huang are external to the ENTRAPID environment and require a proxy to interact with the kernel. In contrast, the application recited in claim 7 is part of the routing device and can interact directly with the kernel, unlike the external processes described in Huang.

Therefore, IP Infusion and Huang fail to disclose all of the features recited in claim 7. Independent claims 1 and 13 should be allowable for similar reasons as claim 7. Furthermore, claims 2 and 4-6, which depend from claim 1, claims 8-12, which depend from claim 7, and claims 14-16, which depend from claim 13, should also be in condition for allowance at least due to their dependence from independent claims 1, 7 and 13, respectively.

Applicants further submit that even if the combination of IP Infusion and Huang did disclose or suggest each of the features recited in claim 3-16, one skilled in the art would not be motivated to combine the advanced routing suite of IP Infusion with the protocol development environment (PDE) of Huang as suggested by the Office Action. However, Applicants submit that one skilled in the art would not be motivated to combine the IP Infusion and Huang references as suggested in the Office Action.

According to MPEP §2143.01 "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. ... The teaching, suggestion, or motivation must be found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. MPEP 2143.01.

IP Infusion is directed to an Advanced Routing Suite is directed to a virtual routing system. The virtual routing system of IP Infusion comprises one or more virtual router wherein each virtual router comprises a full implementation of a physical router at the software level. IP Infusion, page 5, col. 2, ¶ 2.

Huang is directed to a protocol development environment (PDE) that "aids the creation of correct, efficient, scaleable, and robust protocols." Huang, page 1, col. 1, ¶ 2. The PDE enables protocol developers to implement, visualize, and verify their work before development in the field. The PDE enables developers to implement and test protocols that are normally resident in kernel space, such as TCP and IP, entirely in user space. Huang, page 1, col. 2, ¶ 2. The PDE is configured to enable protocol developers to move software from the PDE to the Internet and vice versa. The PDE components are configured to behave in a similar fashion as equivalent components on the Internet, including simulating packet loss, flow control, routing, and link outages such as what might be experienced if the protocol software being tested were run on the Internet. Huang, page 1, col. 2, ¶ 3.

Applicants submit that IP Fusion provides no teaching, suggestion, or motivation to combine the Advanced Routing Suite (ARS) described therein with the protocol development environment PDE for testing and developing protocols for use on the Internet described in Huang. Applicants submit that one skilled in the art would not be motivated to combine the ARS described in IP Fusion with the PDE of Huang, because the PDE of Huang is merely protocol development environment that provides a platform for developing and testing Internet protocols. The PDE of Huang is merely designed to be used in creating and testing new applications and is not intended to support live routing environment. See Huang, page 8, col. 1, ¶ 2. In contrast, the ARS of IP Fusion is designed to perform routing functions (similar to the functions of a physical router) for hundreds or thousands of users, each of which may be using different applications. See IP Fusion, page 2, col 1, ¶ 2. Combining the PDE of Huang with the ARS of IP Fusion lead to the following: (1) overhead would be drastically increased by virtualization (Huang, page 7, col. 1, ¶ 1-4.), and (2) scalability of the ARS would be affected due to additional processor and/or memory resources required to support the kernel and process virtualization of Huang. Huang, page 7, col. 2, ¶ 2-4. Thus, the performance of the ARS would be negatively impacted. Therefore, one skilled in the art would not be motivate to combine the ARS of IP Fusion with the PDE of Huang as suggested by the Office Action.

Furthermore, "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the

teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)." MPEP §2143.01. IP Infusion identifies four design goals for implementing virtual routing: (1) the implementation must be scalable, (2) minimize modifications to current routing and route table management software, (3) maintain the look and feel of the existing product, and (4) platform portability as an essential goal to enable developers to quickly integrate virtual routing into a variety of operating system and TCP/IP stack environments. IP Infusion, page 4, col. 2. If IP Infusion were combined with Huang as suggested by the Office Action, each of these four principles of operation of IP Infusion would be changed.

First, if the PDE of Huang were combined with the ARS IP Fusion as suggested, the scalability of the ARS would be negatively impacted. Specifically, IP Fusion indicates that the implementation of the ARS must be scalable to hundreds or thousands of virtual routers and that speed is favored over other considerations. However, if the ARS were modified to include the PDE of Huang as suggested, the CPU time required to support the virtualized kernels and associated virtual and external processes of Huang would impose limits on the scalability of the ARS of IP Infusion. See Huang, page 7, col. 2, ¶ 2-4. Second, major software modifications would be required to integrate the PDE of ARS into current routing and route table management software. Third, the look and feel of the existing ARS would need to be significantly altered in order to combine the PDE of Huang with the ARS. Finally, and possibly most importantly, the platform independence of the ARS of IP Fusion would be severely limited. The PDE Huang is limited to various versions of the BSD operating system. However, the ARS is intended to be utilized with a plurality of operating systems.

Therefore, even if the combination of IP Fusion and Huang taught each of the features of claims 3-16 (which it does not) one skilled in the art would not be motivated to combine the ARS of IP Fusion with the PDE of Huang, because the principles of operation of the ARS of IP Fusion would be changed.

Accordingly, Applicants respectfully request that the rejection of claims 3-16 be withdrawn.

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Reply to Office Action of October 22, 2007

PATENT

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 858-350-6117.

Respectfully submitted,



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